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NOTES ON THE YUKON COUNTRY.

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OCCUPYING the north-westerly portion of the continent of North America, west of the 141st meridian west of Greenwich, is the territory of Alaska, which up to 1867 was known as Russian America. In 1867 the territory was purchased by the United States from Russia for \$7,200,000. On the eastern side of the 141st meridian, the country belongs to the Dominion of Canada, and from the 60th degree of north latitude to the Arctic Ocean forms a part of the Canadian North-west Territories.

The 60th parallel of north latitude is the northern boundary of British Columbia, and is referred to here, because by a treaty made between Great Britain and Russia in 1825, the eastern boundary of Russian America was fixed at the 141st meridian, and was continued south-easterly along the Pacific coast as far as the 56th parallel of latitude, including Prince of Wales Island and the other islands northerly and westerly of the channel mentioned in the treaty, and ceded at that time to Russia.

Alaska naturally falls into two divisions: the western lying to the west of the 141st meridian, and extending thence to the Pacific, to the Bering Sea, and to the Arctic Ocean; the eastern extending south-easterly from the 141st meridian, along the Pacific coast, as already mentioned, to the 56th degree of latitude. This vast territory contains about six hundred thousand square miles; being nearly eight hundred miles long from north to south, and about seven hundred east and west. It has a sea-coast longer than the combined seaboard of the rest of the United States on the Atlantic and the Pacific. Neither does this include

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the line of the Aleutian Islands, which extend for hundreds of miles from the Alaska peninsula towards the Asiatic coast.

The interior of Alaska is principally drained by the Yukon river and its tributaries, and is known as the 'Yukon country.' The main river, the largest in North America flowing westward, is navigable for eighteen hundred and fifty miles, from its mouth to the junction of the Pelly and Lewis rivers, by 400-ton stern-wheel steamers drawing four feet of water. The Porcupine river, which joins the Yukon near the Arctic Circle, at the old Fort Yukon of the Hudson Bay Company, is navigable for one hundred miles. It flows, first northerly, then westerly, through British territory, to the 141st meridian; thence south-westerly until it joins the Yukon, near the 145th meridian. One of the tributaries of the Porcupine takes its rise near Peel river, a tributary of the Mackenzie, which reaches the Arctic Ocean between the 134th and 136th meridians.

The main river, at the old Fort Yukon, is about eight miles wide; but it gradually narrows, up stream, to about three-quarters of a mile, at the junction of the Pelly and Lewis rivers, as far as which it bears the name Yukon. Navigation is continued by the Pelly for fifty miles farther. Along the Lewis and Five Fingers, a 150-ton steamer, with powerful machinery, would be able to pass on three hundred miles farther, by Hootalinqua river to the head of Lake Teslin, in British Columbia. By Taku river and inlet the distance from Lake Teslin to the Pacific is given at twenty-six miles by the trail.

Passengers or freight for the Upper Yukon are obliged to land at St. Michael's, which is about sixty miles to the north of the usual entrance to the river. This has been the principal trading-post of the Alaska Commercial Company, and the outfitting-post for their stations on the river, for the past twenty years.

It may be asked why a location for a town has not been made nearer the mouth of the river. In explanation it may be said that the Yukon flows into Bering Sea through several mouths, that farthest north being nearly one hundred miles distant from the most southern channel. The various terminal branches turn from a westerly to a northerly direction, and reach Bering Sea near latitude 62° north, a short distance south of Bering Strait; river steamers are therefore obliged to steam out into the open waters of Bering Sea to receive freight or passengers. So far as is known, there is not a suitable location for a town where the high water on the breaking up of the ice in the river does not overflow.

The Yukon is shallow at its mouths, the greatest depth found being only eight feet. The ice passes out, and leaves the river free for navigation, about the middle of June, but it does not leave an approach open to St. Michael's till several days later. If a station could be located with easier access to the river some advantage might be gained, but until the ice had run out, no progress could be made up the river.

St. Michael's is, strictly speaking, a native town. Apart from the buildings and store of the Alaska Commercial Company and the residences of its employees, a church and the residence of its pastor, the houses are those of the natives. Enormous supplies of goods are shipped

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there every year for the trading-posts and missions on the river. During the months at the opening and closing of the season of navigation, St. Michael's presents an air of bustle and business activity not found at any other of the frontier Alaskan towns.

A new company, the North American Transportation and Trading Company, is making arrangements to build warehouses and a trading-post about a mile south of the former town. This company has established trading quarters at Fort Cudahy, near where the international boundary crosses the Yukon. As might be expected, the life artery of this western division is the river from which it takes its name, which has served as the highway of nations and tribes for many centuries, long before the white man, with his improved means of transport, accomplished the feat, marvellous in their eyes, of traversing in one brief season the distance from its deltoid mouth to the Hudson Bay Fort at the junction of the Yukon and Porcupine rivers.

The natives inhabiting the banks of the great river belong to two tribes. The Indians of the interior, of the Athabaskan stock, occupy the banks of the Yukon and its tributaries eastward of the Anvik river. These are called Ingalits. The hardy Eskimo, or Innuits, on the other hand, live along the coast of Norton Sound and on the lower Yukon and the Kuskokwim delta. At an early period, the Eskimo advanced across the divide between the great river and the sea, and followed its course up nearly to Nulato, settling along the banks of the Chageluk river; but they were not allowed to hold peaceable possession, for the Ingalits rallied from all directions and drove the intruders back, far down the river. From time to time the Eskimo advanced again, and many are the traditional tales of bloody battles and years of war between the tribes. The result is that no Eskimo will ascend beyond the mouth of the Anvik, at the present time, nor will an Ingalit descend beyond that point unless accompanied by white men.

When passing up or down the river during the busy season—that is, the brief summer—the traveller would form an incorrect estimate of the population were he to base it on the number of those living on the banks of the river, for he would find, were he to make a short excursion into the almost impenetrable forests and over the hills and mountains, that along the river only exist the conditions necessary for life throughout the year. The small rivulets of the interior, and the vast swampy plains, covered with snow for seven or eight months of the year, are only visited by the trapper, when the skins of the marten, mink, and musk-rat are in their prime. Along the upper reaches of the Yukon and the Tanana the inhabitants are less dependent upon the river, and fish and game are more abundant.

A recent writer says:—"For hundreds of miles from the sea the Yukon flows through low, level tundras, or mossy morasses, resting upon a foundation of clay. The shifting current of the river eats away the shores on either side with astonishing rapidity; the dull thud of caving banks is constantly heard by the traveller. Stepping upon the shore the explorer must jump from hummock to hummock, or wade around from knee to waist deep. In many places the ice never disappears within

few inches of the surface, being protected from the rays of the sun by a non-conductive carpet of sphagnum. Wherever there is a slight elevation of ground in all this watery waste the wretched natives have located their villages, the dwellings consisting of excavations in the ground roofed over with mounds of sods. Here they fish during the summer, and hunt the mink and the moose in the winter."

The following is the latest account of the proceedings of Mr. Wm. Ogilvie, Chief Dominion Surveyor, who is engaged in delimiting the international boundary between Alaska and the North-west Territories of Canada. The particulars were sent by Mr. Albert M'Kay, one of Mr. Ogilvie's staff, to a friend in Calgary. In his letter he explains to his friend that at Fort Cudahy, where he was writing, June 24th, 1896, only three mails are received *per annum*. His letter only reached Calgary in August. It says:—

"Mr. Ogilvie's party left Victoria, B.C., 9th July 1895. They had along with them three cedar, lightly-built Peterboro' canoes; these they packed along with their baggage, from Taiya (the head of navigation) *via* Chilcoot Pass to the headwaters of the Yukon at Lake Lindeman, a distance of about twenty-five miles, during which they reached an altitude of 3375 feet from sea-level. Thence they proceeded from Lake Lindeman along several lakes and Lewis river. Leaving Lewis river at Fort Selkirk, they went along the Yukon to Forty Mile Creek, the distance together being 590 miles, in the canoes, with the exception of three portages, where everything had to be carried. The journey was made in twenty days.

"To find a suitable place for winter quarters Mr. Ogilvie's party went down the Yukon thirty-seven miles farther, where they built and fitted up a camp and erected an observatory. Here a number of astronomical observations were made to determine the geographical position. This Mr. Ogilvie found to be $140^{\circ} 54' 8''$ west longitude, and $64^{\circ} 41' 6.4''$ north latitude—a little less than two degrees south of the Arctic Circle. The line of demarcation (141° W.) between the United States and Canada was found to be a few hundred yards farther down the Yukon. Where it crosses, the great river narrows to about 1300 feet, discharging a volume of water of 100,000 cubic feet per second."

Mr. M'Kay further writes that the long winter nights and short days passed by comfortably. The party had abundance of fresh meat, as a herd of nearly 1000 caribou had made a *corral* for themselves at no great distance from the camp. Eighteen carcasses were speedily secured and kept frozen until required. The lowest reading of the thermometer for December 1895 was, on the 4th at dawn, 54.1 degrees below zero, and at 1.30 P.M. 46.2 degrees. On January 4th, 1896, at dawn 62.7 degrees, and at 1.30 P.M. 64.2 degrees. There were three periods of three to six days each, with the mercury in the neighbourhood of 60 degrees below zero (Fahr.).

On February 19th Mr. Ogilvie broke up camp, to carry out his instructions from Ottawa, and establish a portion of the international line between Alaska and the North-west Territories. Starting from where the line, on the 141st meridian, crosses the Yukon, he proceeded due

south, cutting out the line through the forest over mountain and valley for a distance of sixty miles, food and luggage being hauled on toboggans, and Mr. Ogilvie also drawing his astronomical and scientific instruments.

As winter travel in the Yukon country is done by the toboggan, it may be interesting to describe the sledge or carriage. It should be about seven feet four inches long, seven inches high, and sixteen inches wide, of strong but light timber, and with runners shod with either brass or steel, the former being preferable, because the sledge will glide over the snow more smoothly in intensely cold weather, while steel is inclined to grind and lug very much, as if it were being hauled over sand. When the weather is cold, if water is taken into the mouth and held a moment and then blown over the runner, a coating of ice will immediately form; and if this process is repeated when necessary it is surprising how much easier and more smoothly the sledge will draw. It is preferable to adopt the Eskimo mode of making sledges for Yukon travelling. They use no nails or bolts, binding the joints together with strong cords or thongs.

The survey party, as they proceeded, intersected Forty Mile Creek, twenty-three miles from its mouth, where it joins the Yukon. This gives Canada twenty-three miles of the creek, which, with its banks and surrounding country, are highly auriferous. The work of demarcation, so far completed in that trip, occupied nearly two months, when the party returned to Fort Cudahy.

The work which has to be performed by the survey parties is by no means child's-play or as agreeable as a picnic. Mr. Ogilvie, in describing some of the work performed on the south-eastern coast of Alaska, says:—"The labour in connection with the survey is extremely hard; there are many giddy precipices, yawning chasms, and frowning cliffs to be surmounted. A man must be of iron frame and constitution to stand it." As an instance, Mr. Ogilvie and the members of his party on one occasion started at two o'clock in the morning; walked at least fifteen miles through snow often waist deep; forded a river running with ice water thigh deep one hundred yards in width; crossed several smaller streams by fording; traversed the slope of the Mendenhall glacier, meandering here and there over its surface to avoid the deep crevasses, to the summit of a mountain at its head, 6100 feet above sea-level; spent two hours on a giddy cone on its top, from which there was a sheer descent on one side of 2000 feet; and returned by the way they went, tired, hungry, wet, and cold, arriving back at camp at twelve o'clock the succeeding night. Thus every member of his party on that occasion endured twenty-two consecutive hours of the most severe physical labour, apart from the cold and suffering. Twenty-five ascents were made by his party during the summer (1894); several of them were to heights of 6000 feet and upwards, many up to 5000, the majority over 4000 feet.

The method adopted in carrying out this mountainous survey work—photo-topography—has lately excited much public interest. The system pursued can hardly be understood by ordinary readers without mathematical training, but the following facts stated by Mr. Ogilvie will be interesting. The idea is older than photography itself, for the attempt

was at one time made to compile a chart from sketches of country drawn in the dark camera. Photo-topographic surveys of a kind were made in France, Germany, and Italy a great many years ago, and in the United States at least one text-book was written on the subject; but its development to its present state of perfection, as adopted by the Alaskan Boundary Commission, is due to the Surveyor-General of the Dominion of Canada, Mr. E. Deville. He took up the subject some years ago, and during the years between 1884 and 1893 Messrs. J. J. M'Arthur and Mr. W. E. Drewry, acting under his instructions, tested his ideas and devices in actual work along the line of railway in the Rockies and westward.

To sum up the method and express it in a popular manner, it is the solution of the sides of a triangle. Almost every one knows that with a given line of any finite length, and the direction of any given point from each of its ends, that point can be located. Now, suppose a line and any point or any number of points which it is desired to locate with reference to its ends. Then suppose photographs taken from each end of this line, each of which shows all those points in its field. It is easy to see that after the observer has oriented those views—that is, located the direction of the centre of the picture from the point of sight—and knowing the focal length of the lens used in the camera, he can lay off or project on the picture-plane the direction of any point or points in each picture. Lines drawn in those directions from the ends of the base will intersect each other in the position of any desired point, so long as it can be distinguished in the view. Its elevation with reference to the station occupied is determined on the same principle that elevations are found with the transit or theodolite—that is, from angles of depression or elevation.

Juneau, situated on the mainland coast, twelve miles west from Taku Inlet, and opposite Douglas Island, is the largest town in Alaska, and the commercial metropolis. It is built at the base of a mountain which rises almost perpendicularly for nearly three thousand feet, forming a most picturesque background. The town contains about 2000 inhabitants. Nearly all the ground available for building purposes is occupied. Sitka, on Baranof Island, continues to be the capital of Alaska. It was formerly the capital of Russian America, and was founded under the administration of Alexander Baranof, who held office as governor of the Russian American colonies from July 27th, 1791, until January 11th, 1818; his predecessor, the first governor, having held office from August 3rd, 1784, until July 27th, 1791. At that time, the seat of Government was on Kadiak Island, five hundred miles west of Sitka. Governor Baranof built a large castle in 1813. The city boasts of its Greek Church, with its dome painted blue and chime of bells. The Industrial School and the Jackson Museum are visited with much interest by tourists. It contains a large collection of Indian curios secured by Dr. Sheldon Jackson, who is a zealous worker in the cause of education and in missionary work among the natives. The population of Sitka is computed at 500.

In the interior of the Yukon country, the towns are chiefly mining